The JOURNAL of GEOGRAPHY

VOLUME XXXIX MAY, 1940 NUMBER 5

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Published by A. J. NYSTROM & CO., for THE NATIONAL COUNCIL OF GEOGRAPHY TEACHERS
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***The Journal* is the official organ of the National Council of Geography Teachers and is sent to all members of the organization. The annual dues, $2.00, are payable to the *Journal of Geography*.** Extra postage rates for copies sent to foreign countries should be added to the membership dues.

Patrons are requested to make all remittances payable to the *Journal of Geography*, in postal or express money orders or bank drafts.

Members and subscribers who wish to continue receiving the *Journal* must send remittances promptly to assure the volume being complete.

Send manuscript and books for notice or review to the *Editor*.
Send orders for back numbers to *Journal of Geography*.

Published monthly except June, July and August

PUBLICATION OFFICES: 450-454 AHNAIP STREET, MENASHA, WISCONSIN

Business Correspondence, Membership Dues, and Subscriptions may be sent to Publication office or to

A. J. NYSTROM AND COMPANY
PUBLISHERS, JOURNAL OF GEOGRAPHY
3333 ELSTON AVENUE, CHICAGO

Entered as second-class matter January 15, 1919 at the post office of Menasha, Wisconsin, under the Act of March 3, 1879

The JOURNAL *of* GEOGRAPHY

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TOBACCO PRODUCTION: SAN JUAN-SAN LUIS, CUBA

MILDRED LETITIA LESTINA
Chicago, Illinois

In the Veulta Abajo district,* in the far western end of Cuba, is located the San Juan-San Luis sub-district. Producing more than one-half of the tobacco of the district, it has full well contributed its share to the fame which the district enjoys, as the "heart" of the tobacco industry.

The plantations, strung along the natural levees of the water courses and the gently undulating and better drained, flattish lands of the interstream areas, occupy only the most suitable land. The crop distribution on a particular plantation is closely knit to the type of soil but also reflects the areal pattern of land occupancy as correlated with the topography of the terrain and the types of soil present. The gently undulating slopes of light gravelly soil are planted in shade tobacco; whereas, the heavier, flatter lands are planted in sun tobacco. The poorly drained lands are left in pasture, and those better drained, but not suitable for tobacco, are planted in subsistance crops.

Likewise, the cultural features in the landscape reflect not only a well planned orientation of the plantation, or finca, but an orientation influenced by natural factors and such historic factors as exhibit themselves in the traditional fuedal-like layout. Buildings used in the processing of tobacco and the housing of equipment are scattered over the terrain and are located in close juxtaposition to the producing areas. The owner's or administrator's residence is usually on the margin of the tobacco plots facing the main plantation road. It is a rural Cuban type of rectangular, one story, stucco structure with a large veranda and tile floors. Its spaciousness reflects the Spanish influence in its architecture. Electricity generated from the larger rivers is used for lighting and charcoal produced

* See JOURNAL OF GEOGRAPHY, February, 1940.

on the plantations from Cuban hardwoods and maraboo is used for cooking. Most of the plantations, which were originally parcelled out as land grants by the crown in the seventeenth century, are managed by sub-lessee planters. Many of the planters emigrated to this district from the Canary Islands. They are descendants of English colonists who settled in the Island. The personal quality of spunk and assidiousness of these Canarians has made them successful growers. They were willing to put up with hardships and take small rewards; they lived simply and did not give up easily. It was

Fig. 1. An administrator's residence facing the road and close by, to the left, the selection barn. The selection barn is always close to the plantation road where it can be easily reached by trucks which carry the selected tobacco to the railway.

such human characteristics that enabled them to survive the discouragements of the industry's early development and promote it to its present status.

Palm thatched roofed dwellings of the permanent laborers, who are employed on the plantations, are scattered in the uncultivated lands. These resident workers are allocated a small patch of ground on which to grow their few subsistance crops consisting of bananas, corn, yucca and malanga. Very few have any livestock other than a few chickens, a pig and a saddle horse or two. Such conveniences as running water are not available. If they are not close to a river they use water carts, consisting of a barrel mounted on wheels and drawn by oxen to bring in the daily supply of water. The cart is

driven into the river and the barrel is filled by dipping the water with buckets.

On the other hand, huts of the Negro laborers, who are hired sporadically during crop time, are located on municipal lands between the plantations and the public roads or along the river courses. Many came to this district recently from Remates. Their huts are very primitive, small one-room dwellings, built with palm bark walls, palm thatched roofs and mud floors. The cooking is done outside on an open fire. A small patch of subsistence food crops and a few chickens supply most of their needs. Two five-gallon petrol cans suspended from a wooden yoke across the shoulders serve to carry their water from the river. This chore is usually performed by the children. Barefoot and scantily dressed they come to the river in the early morning and make as many trips as required to supply the family needs.

Fig. 2. Permanent laborer's hut. Patch of subsistence crops back of the hut, a few chickens and a cow or two and water wagon used for hauling in the daily supply of water fulfill the daily needs.

PRODUCTION OF THE TOBACCO

Scattered on the choice lands are the tobacco plots. Not necessarily regular in shape but in harmony with the contour of the terrain and type of soil. Intensive crop production is well adapted to the small plots of suitable tobacco land, and tobacco is a crop requiring a great deal of hand labor performed with a few simple tools.

Seedbeds which are in most instances located some distance from the plantation are prepared for planting in March and April. The lands are plowed at intervals, not only to kill the weeds, but to areate the soil. The beds are divided into rows, twenty yards long and a yard wide, with enough room between the rows to facilitate easy weeding and irrigation. A portion of the seed beds is sown about September 15 and thereafter sowings are repeated three or

four times at intervals of twenty days. The time operations begin depends on the amount of rainfall, number of rains and condition of the soil. Spacing the sowing at intervals prolongs the harvest season.

The quality of the crop depends on the type of seed used and soils in which it is grown. A particular type of seed grown in a soil, other than the one in which it was produced, will produce a plant not like that from which the seed came but characteristic of the soil. "Havanensis," a seed procured from the selected native plant, is most widely used, altho three other varieties; namely, "Lancifolia" from Puerto Rico, "Macrophila" from Mexico, and the "Virginica" from the United States are used in some sections of the island. The "Havanensis" is preferred, since it yields more tobacco of a better grade. The other varieties were introduced during and after the war of independence, at which time tobacco growing almost disappeared, and it became necessary to import seed.

Fig. 3. Plowing. The primitive Creole plow is drawn by oxen. This slow old world method is well adapted to the small patches of tobacco land.

The average production of one square yard of seed bed is about 1,500 plants. Extreme care and precautions are exercised to give the plant most suitable conditions under which to develop. The young plants are covered with cheesecloth or mats to protect them from burning. These covers are shifted daily to prevent them from sticking to the young plants. In order to maintain a humid condition of the soil for quick germination, the beds are irrigated. When the plants are strong enough to withstand the hot sun, the cover is removed and the amount of water applied is lessened, permitting the plant to develop a strong root-system. To keep the land free from weeds, as well as to create a dust mulch, the beds are hoed frequently. After the plants have reached a height of three or four inches Paris Green is sprayed to kill the insects. The plants from the first seed beds reach the stage for transplanting after thirty-five or forty days from the time of planting or about November 1. The transplanting proceeds from this date to the first of January.

While the seedlings are growing in the seedbed plots the tobacco lands are being prepared for transplanting. The drenching rains appear in June, after a period of scanty rainfall, and a prolific growth of grass appears in the tobacco plots. This grass cover when plowed under forms upon its decomposition a fine source of nitrogen. In addition manure and tobacco stems are scattered on the land and worked in with the many plowings.

The lands are plowed at intervals, first with an American plow which turns up only three or four inches of soil and can cut thru

Fig. 4. Windbreak tobacco plots. Cheesecloth is only strung along the outside of the tobacco plot to break the wind.

the matted grass easily, while the subsequent plowings are carried on with Creole plows. Oxen are used to draw the plows. They not only stand the heat better, but are stronger and cheaper to keep. The air is filled with the familiar coaxing call to the slow trudging oxen, while the laborers work diligently between the heavy showers, in an attempt to get the land in the best of condition for transplanting.

The cultivating methods employed exhibit a well planned, scientifically analyzed program. Such a fund of practical knowledge as gleaned by trial and error methods are applied to such problems as insect extermination, irrigation, production of light weight, light colored, undamaged leaf by shading and windbreak.

The original method of transplanting the seedling was to set out the young plants in dry furrows and place the plants in holes made by a stick. This method resulted in damage to many of the young tender roots. Plants with such damaged root systems in dry soil became an easy prey of the root worm *pesadaro*. Spraying was of little value since the worm does its damage under the surface of the soil. Discovering that it particularly avoided the water and

damp earth, a method of attack was devised. First the furrows were flooded with water and the plants were inserted in the damp earth with the forefinger over the root serving as a guide. Sufficient water exists in the soil for a few days to keep the soil damp, and discourages the worm until the small plants have established and developed a sturdy invulnerable root system. This method reduced the loss by transplanting from sixty to two per cent.

To protect the shade tobacco from the intensive sun's rays, cheesecloth is strung vertically along the sides and top of the tobacco plots. To hold the cloth in position a skeletal mesh of posts standing about ten feet high at intervals of four feet is built. Unlike shade, windbreak tobacco, which requires less protection but does not produce as fine a leaf, is shielded from the wind by cheesecloth which is strung along the sides of the plots, and single rows of corn are grown between every ten rows of tobacco.

Intensive activity correlated with the care of the crop does not cease with the transplanting and shading. Hoeing commences twelve to fourteen days after transplanting. It follows the old established geoponic pattern. The number, which averages about five or six, is gauged by the abundance of rainfall or irrigations, and the rapidity of the growth of weeds. With the first cultivations, the furrows are filled to a depth of six to eight inches. With the second, the land is "hilled up" and with the third, a ridge is built around the base of the plant to give it support. Much of the hoeing is done during the night. The bright starlight skies offer sufficient light and the cooler temperatures are more conducive to work.

Along with hoeing, irrigation is begun and continues at intervals of about every twenty days. Where the land is hilly, small dykes are built to keep the water near the plants.

Approximately twenty-five days after planting, the plant reaches its maximum power to manufacture plant food and heads or buds begin to appear. To conserve all the available food for the leaves, these buds and later appearing shoots and suckers are removed. Soon after the plant reaches its maturity and is ready for harvesting.

Harvesting and Preparing the Product for Market

Harvesting proceeds in a rhythmical procession. Two methods are used; namely the strip and stalk. By the former method each leaf is stripped off separately, and by the latter, the stalks are cut into sections allowing two leaves to each section. The strip method

permits of course the gathering of the leaf when it is in prime condition.

The bottom first four leaves known as *libras de pie,* being the first to mature are the first to be harvested. In the progress of harvesting the six center or *principal* leaves are gathered four days later, and the top or *coronas* are gathered later.

Fig. 5. Harvesting the middle leaves. The "foot" leaves were gathered four days ago. The leaves are carefully placed in a basket one layer deep. Note that the soil is hilled up around the base of the plant to give it support.

The strip method of gathering is used in preference to the stalk method. Each quality grown can be more easily kept separate, and more care can be exercised as to the handling and state of maturity of the leaves. Likewise sun tobacco is also gathered under the strip method, but only in the rainy years; in the drier years, the stalk method is used. Not only is the latter a cheaper method, but because the sun grown tobacco leaves are undesirably heavy and by being permitted to dry on the stalk, which stays green from ten to fourteen days, some of the nutritive material passes into the stalk, and the heaviness of the leaf is reduced. After the harvest, a second growth crop called *retano,* of both sun and windbreak, is gathered. The yield is of low grade, and suitable only for cigarettes.

The shade and windbreak tobacco is carefully picked, and in the field is put into shallow bamboo baskets measuring about three feet in diameter. When the bottom of the basket is filled, it is covered with burlap and brought into the curing sheds. The stems of the leaves are pierced, tied face to face in pairs, and strung on a pole holding about forty pairs and put on racks to dry.

The curing sheds, located in close proximity to the fields, appear like mounds of straw from a distance. Low and rectangular in shape,

measuring about twenty feet by forty feet by twenty feet they are of heavy hardwood frame construction to withstand hurricanes. The upright posts are imbedded in cement blocks and connected with crossbars near the roof. The framework is covered with thatch, which is tightly bound to the rafters. A cover of Palma cana or palmetto leaves is used for the sides, and barrigonia leaves in preference to Palma cana for the roof. The floors and racks are made of wood. Windows in the side, back and front, provide sufficient areation if humidity and temperature rise too high within. Upright racks, constructed with rounds one foot apart, upon which the posts are placed, rise from the floor and are attached to the rafters of the roof. They follow in succession from the front to the back of the barn. The curing process which takes from thirty to thirty-five days, requires the judgment of an experienced planter who can recognize the conditions present and decide what steps or precautions to take in the event that factors unfavorable to the curing process develop. What appears to be a fine crop can be ruined in the curing process and what appears to be a poor crop can be improved by the proper method.

The fresh leaves, strung on the poles, are placed on the racks near the roof, the driest part of the barn. As the curing proceeds, they are shifted to a lower position on the rack, where the humidity is higher and the temperatures are lower. The relative humidity of about 85 is maintained near the floor, and the temperatures are kept between 70° and 80°. If the relative humidity rises above 85 per cent due to moisture laden south winds, a rust develops, dormant spores develop and the fungus lives on the food of the leaf. After the leaf is cured these areas appear as white blotches. If the areas are too extensive, especially in wrapper tobacco, the leaf has to be discarded. To alleviate this condition, the sun tobacco is brought out and left in the sun for about two days to dry out; but in the case of shade or windbreak tobacco, charcoal, made from a hardwood procured from the Zapata peninsula, which does not give forth any smoke or smell, is burned in the barn. The fires are kept going for about forty-eight hours, or as long as the planter deems it necessary for the drying of the leaves.

To aid the curing process the barn windows are opened or closed depending on the atmospheric conditions present. Moist weather delays the curing process; whereas, the dry weather hastens it.

The leaf undergoes two processes in curing; (1) losing gradually the water it contains; (2) changing color. If the humidity is

low, the water is eliminated too rapidly and the leaf withers and dries. Leaf produced under such circumstances is dark green and lifeless. When such atmospheric conditions are present the barns are kept tightly closed to retain within as much heat and humidity as possible.

The changing of color is caused by oxidation of the drying cells in the leaves. To meet these conditions the tobacco is shifted to the lower part of the barn. Plenty of air and high humidity are needed for this process; but if the relative humidity exceeds 85 per cent, when the tobacco is becoming yellow, the leaf epidermis will peel due to the prolonged elimination of water. After the leaf has reached the proper color and the midrib is thoroly dried, the poles are again put near the roof of the curing shed, the driest part of the barn, to retard the oxidation process and to keep the leaf from getting too dark.

The fermentation process is the second curing process, and as in the first, care and experience are necessary to diagnose the conditions and apply the remedy. The fermentation process takes place in May or June when the winds are from the south and bring rains which raise the humidity. The shade or windbreak tobacco, is tied into sheaths and the sun grown tobacco, which was left attached to the stems is fastened in bundles and heaped into piles where it is allowed to sweat. When this process is completed the tobacco is transferred to the selection barns.

The selection process which extends from the latter part of June thru July, August, and the early part of September fits in with perfect harmony with the advent of the heavy rains which raise the humidity during these months and keep the leaves more pliable.

The selection barn is a rather low rectangular structure about one-hundred feet long, forty feet wide, and twenty-five feet high. Like the curing sheds the skeleton is made of heavy hardwood posts, but instead of thatch the side walls are of boards and the roof is galvanized iron. Windows along the sides, front and back, covered with cheesecloth to keep in the humidity, furnish ample light for the selectors to carry on their work. The walls are whitewashed and floors are of cement. About ten feet overhead is a pipe line spray used to humidify the air when the natural humidity is not sufficient.

The only furnishings are long rows of low chairs, placed in pairs facing each other and small tables between each pair. It is on these little tables the selectors place their sorted tobacco. The selection is carried on by a group of skilled workmen including both men and

women. To alleviate the tedium a hired reader stands in the aisle, and usually reads the newspaper in the morning and in the afternoon, a novel or whatever book the majority may choose.

The tobacco is first roughly sorted into types suitable for wrapper and filler. After this rough sorting it is classified into grades. Women are preferred to men for this final selection, since their fingers are more nimble, delicate, and sensitive to the weight of the tobacco. Shade tobacco is divided into twenty-eight *tiempos,* or grades, which include four major divisions based on quality, texture, color and size. Sun tobacco, is sorted or classified into only four *tiempos.*

After grading the tobacco is tied into bundles or "hands" which in turn are tied into larger bundles, *manajo,* consisting of four "hands" each. The *manajo* are baled in bales constructed of the bark of the Royal Palm; fumigated, and are ready for shipment.

The United States had been the leading customer for Cuban tobacco until 1929, when domestic tobacco production was stimulated and developed intensively. With the conclusion of the reciprocal trade treaties between this country and Cuba, more Cuban tobacco is again finding its way here. Spain has been a large market for cheaper grades of tobacco, but adverse money exchange and internal difficulties at home, have reflected themselves in the declining consumption. Both Holland and Germany were markets of considerable magnitude, but have decreased in the past few years; whereas, Argentina and the United Kingdom have shown a rise. But in spite of world economic difficulties, reflected in trade dislocation, tobacco from San Juan-San Luis sub-district has managed to hold its place thru its quality.

NARVIK, NORWAY

BEATRICE TERRY
Columbia, Missouri

Narvik, a port of 6,300 people in northern Norway, is, in total trade, one of the lesser Norwegian ports. It is, however, unique in that it exports a large amount of Swedish iron ore (over 2,000,000 tons in 1931), a raw material which is shipped to various European countries and to the United States and Canada. Narvik also enjoys the distinction of being the western terminus of one of the most northern railroads in the world, a railroad first among Norwegian lines in the amount of freight tonnage carried. Moreover, Narvik is one of the newer towns in Norway, for forty years ago it was only a small fishing and farming community.

Why is much iron ore from north Sweden shipped from the Norwegian port of Narvik? What special advantage does the port offer? What form has this new town in an old land taken? Answers to these questions are to be found not only in certain features of Narvik itself, but in various factors abroad.

SOME FACTORS AFFECTING THE TRADE OF NARVIK

Because Swedish ports on the Baltic are frozen during the winter, the desirability of shipping iron ore the year around led to the building of a railroad from the mines of northern Sweden to some point on the ice-free Norwegian coast. The terminus selected there was Narvik, a small fishing community toward the eastern end of Ofotden Fjord, now twenty-five miles by railroad from the Swedish border.

At first thought it seems that a terminal site nearer Sweden would have been not only desirable but possible, for an arm of Ofotden Fjord extends east some ten miles beyond Narvik to within five miles of the Swedish border. An examination of a large scale map, however, shows that such is not the case. The shores of this extension of Ofotden Fjord rise so abruptly that a railroad could not successfully make the descent to sea level. Also, there is no area of land at sea level ample enough for the development of a rail terminal. Furthermore, about halfway up its length the eastern extension of the fjord is constricted by a narrows with shallow water which would make navigation difficult for boats of ocean-going draft. In view of these inhospitable natural features men

chose for the railroad a gentler, longer descent. The route, after winding thru the mountains along a twenty-five mile course with seventeen tunnels, reaches sea level at Narvik on the major arm of Ofotden Fjord.

Here at the end of a mountain spur which dwindles down into an inter-fjord peninsula, there is a flattish area large enough to

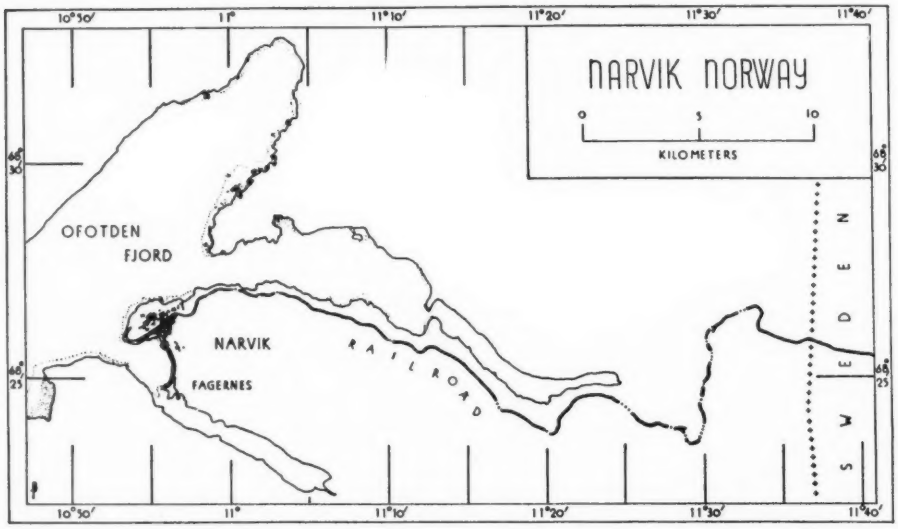

Fig. 1. The situation of Narvik. The land area shown is rugged and broken. In the eastern part glacier-fed lakes abound. About eight kilometers east and somewhat south of Narvik are several small snow-fields. The winding route of the railroad as it descends from a height of 513 meters near the Swedish border and the various breaks in the line, which indicate a number of tunnels and one or two switch-backs, evidence the uneven surface. Besides Narvik there are several small settlements on the fjord; none of them, however, have Narvik's advantages of adequate level land adjacent to a good harbor.

accommodate a rail terminal. And, altho there are shoals to the north of the peninsula, just south of it lies an excellent half land-enclosed harbor over two miles in extent which is twenty-six feet deep at the ore-docks. Electric equipment, much like that in use at Lake Superior ports, loads the ore into boats of from 500 to 10,000 tons capacity. Most of these vessels then sail for ports in northern industrial Europe. By far the greatest amount of ore goes to Germany—Belgium and Great Britain taking moderate amounts. The United States also buys a moderate supply, while Canada uses a small quantity. Some of the ore finds its way back to Sweden.

What balances the out-going load for steamers that come into Narvik for iron ore? An occasional locomotive for the railroad is

brought in from Scotland; some bunker coal is brought in from Newcastle or Spitzbergen. The total of such imports, however, falls far short of supplying enough freight to balance the out-going tonnage. Most ships, therefore, enter the port in ballast. In view of this fact, people interested commercially in Narvik would like to develop its possibilities as a distributing center for the entire northern part of the country. However, the population of the whole section is so sparse that all the commodities which it might absorb from the outside probably would not balance the tonnage of iron ore sent out.

ARRANGEMENT OF NARVIK

Trade, all-important in Narvik, clearly manifests itself in the town's arrangement. The railroad comes into the town from the northern side of the peninsula at the western end of which Narvik lies, passes around the end of the mountain spur and goes down to the water's edge at the south of the peninsula. A branch line to the south connects Fagernes, two and one-half miles away, where there are iron mines. Ores from these deposits are of poorer grade than the Swedish ores, but are valuable enough to be sent to other parts of Norway for treatment. Railroad tracks, three large oredocks and an ordinary wharf occupy the level strip of land along the edge of Narvik harbor. In a triangular space at the north of the harbor are the railroad shops. The rest of the town, divided into two parts by the railroad as it approaches the harbor, rises steeply to the north. In the section east of the railroad, only three blocks wide, the conventional gridiron street pattern changes to conform with the steep wooded hillside along which the town has developed. In this section lies the commercial district with the two hotels which Narvik supports. To the west between the railroad and the hill which rises at the end of the peninsula, lies the rest of the town on a site which marshes limit at the south and

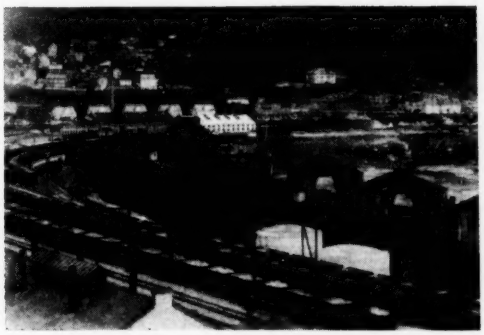

Fig. 2. Ore docks and ore cars, Narvik. The southeastern part of the town lies in the middle ground. The forested hillside beyond shows the rugged mountain area which comes down to Narvik. Courtesy of J. A. Morrison.

northeast. Beyond this built-up area, a group of small farms occupies the northern edge of the peninsula.

APPEARANCE OF NARVIK

The appearance of Narvik is that of a new town. There are no old castles or churches or museums such as those in the older Norwegian cities of Oslo or Trondhjem or Bergen, for the town has grown from a mere fishing community to its present size of 6,300 in the last thirty-five years. Houses not over three stories in height are of wood, well-built to provide protection against the long winters. Narvik's plain appearance, unattractive to tourists, is accented in the winter by the long period when the sun does not reach it. Mountains to the south are sufficiently high to lengthen the sunless period of three weeks normal at that latitude to the three months from November 7 to February 7.

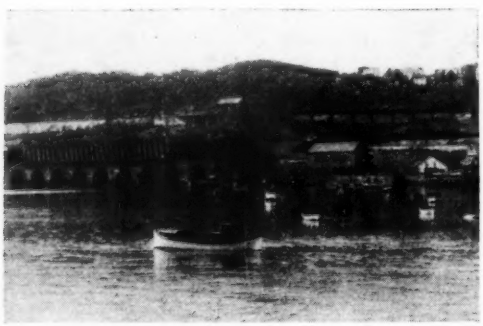

Fig. 3. Ore docks and railroad from the harbor. The forested land in the background is the comparatively low-lying end of the peninsula on which Narvik lies. Courtesy of J. A. Morrison.

Little historical tradition, then, belongs to Narvik. Its distinction is that of a busy commercial town, peculiarly fitted by site and situation to serve as an outlet for iron ore from the near-by Swedish mine district, an area which might otherwise be cut off from world trade during much of the year.

HARBIN, MANCHOUKUO*

SHANNON MCCUNE
Ohio State University

The city of Harbin in Manchoukuo is only a lusty infant in comparison to other cities. Varied human activities and ambitions have formed the city at a place where location and physical conditions are favorable. After a period of phenomenal but erratic development under Russian and Chinese influence, the city is now controlled by the Japanese. Crowded with diverse social elements, Harbin, at the cross roads of Manchoukuo, is of increasing significance in Eastern Asia.

THE NATURAL BASE

Across the North Manchurian Plain the Sungari River, the largest tributary of the Amur, flows to the east. The broad river, nearly two-thirds of a mile wide at Harbin, varies in depth and has a number of islands and shallows. On each side of the river are flood plains over which the river may flow at flood stage in the spring and summer. On the southern flood plain, protected by dikes, is a part of the city of Harbin. Back from the flood plain rises a bluff, broken by a few small tributary streams. On this upper level lies another part of the city. Out over the plain in all directions the landscape is monotonously level.

On the North Manchurian Plain continental climatic conditions prevail. There are great extremes in the temperature regime; the yearly temperature for Harbin is 37.6° F., yet there are monthly extremes of 73.9° F. in July and −6.3° F. in January. During the cold winters air masses drift eastward from the North Asian High Pressure Area. Associated with the monsoon influence are weak cyclonic storms which pass from west to east, adding variations to the weather. Since air masses from the continental interior are so dry, there is very little precipitation in the winter months. In the summer, in contrast, there is a low pressure area over the con-

* Official data have been obtained from three sources:

"Harbin, City of Historic Lore and Romance," *Contemporary Manchuria*, Vol. II, No. 5, September, 1938, pp. 58-93. The Information and Publicity Department, South Manchurian Railway Company, Dairen, Manchuria.

The Japan-Manchoukuo Year Book, 1939, The Japan-Manchoukuo Year Book Company, Tokyo, Japan, December, 1938.

The Manchoukuo Yearbook, 1934, Toa-Keizai Chosokyokyu, Tokyo, Japan, 1934.

tinent which causes warm moist air to drift in from the ocean to the south and east. In this season cyclonic and convectional storms cause overturning of the moist air and precipitation results. The maximum monthly rainfall comes in July and August in Harbin. The great distance from the source of moisture, the ocean, far to the south, and the intervening mountain ranges, are factors in the small amount of average yearly rainfall, 21.7 inches. An added element in the climate is the variation in precipitation from year to year. Some years may have severe droughts occasioned by variations in the cyclonic storms or the monsoonal low pressure area. With a climate of severely cold dry winters and short hot summers with light rainfall, the natural vegetation is grass and the soils are chernozem and similar grassland soils.

The Development of Harbin

In this region of monotonous plains and extreme climates the Russians established Harbin only forty years ago. The town was located where the new east-west railroad, connecting with the Trans-Siberian, crossed the Sungari. Another railroad, going to Port Arthur to the south, made the place a railroad junction. Harbin was intended as the base of Russian penetration and dominance in Eastern Asia. Altho the construction was rapid after 1899, it had an air of permanence. The major Russian settlement was around the railroad zone. The Chinese-Eastern Railroad Company built many blocks of solid houses, administrative buildings, and some fine public edifices, including a magnificent club house. In this section a foreign business and residential district developed; the foreign consulates are located here today. This settlement, built on the higher land, is now called New Town (Novy Gorod) to distinguish it from Old Harbin (Stari Harbin) where the primary settlements were built around garrisons to the southeast. Today Stari Harbin has a few industrial plants along the railroad, the air port, and some military establishments. Between these two districts a Russian residential suburb, Machiakou, grew up. In all of these Russian parts of the city certain elements are characteristic, such as wide streets, lawns and trees around the solid stone homes and buildings, and especially the Russian Orthodox churches and cemeteries.

Down on the flood plain, the port section, Pristan, was built. From the port function on the navigable Sungari there grew a section of warehouses and shipping facilities. In Pristan are located

many of the banking houses and retail establishments for better class merchandise. There are a number of hotels and many amusement centers; the night life of Harbin is famous in the Far East. To the west of Pristan many Russian Jews settled in a poorer residential district, Naharofka. On the level plain near the railroad and river, east of Pristan, were good sites for factories, warehouses, and stockyards dependent upon the expanding agricultural region around the city.

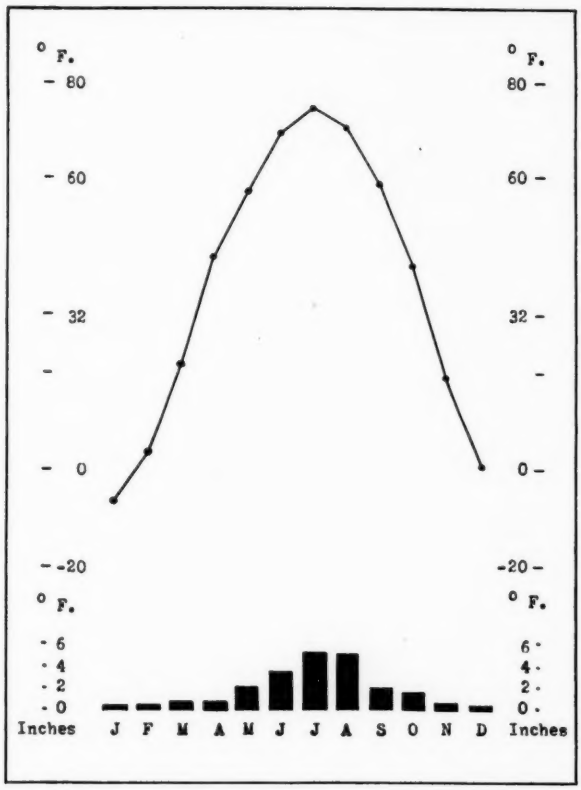

Fig. 1. Climatic Data for Harbin, Manchoukuo, 45° 45′ North Latitude, 126° 38′ East Longitude, 150.5 meters, seven year average. Koppen-Dwa. Maximum temperature, June 8, 1926, 102° F.; Minimum, January 16, 1922, —39° F. Source: *Handbook for Daily Use,* 1939, Government-General of Tyosen, Central Meteorological Observatory, Zinsen, Tyosen, 1939. (Japanese.)

With the increase of Russian and foreign population and the opening of the umland to Chinese agricultural settlement, there was a tremendous expansion of the Chinese population of Harbin, or Pinkiang as they call it. These people settled on the flood plain, east of the industrial section; lacking the room for expansion, they were crowded into a compact unit. The streets are comparatively narrow and this area has the densest population in the city. In other places around the city the Chinese have also settled in village-like communities. Foreign influence is noticeable in many of the buildings and street patterns of the Chinese settlements.

The course of development of Harbin, started so precipitately, continued in the same headlong fashion. During the Russo-Japanese War, 1904-1905, Harbin had the prosperity associated with an army

base. During the following years there was an increase of Russian capital and enterprise under Czarist encouragement. After the Russian revolution refugee White Russians made an influx into Harbin. A few of these people were rich; but there were many more who were destitute. Here was a new situation in the Far East,—a city where the white people would work in competition with the Chinese laborers. With the lessening of Russian aggression under the Soviet government, the Chinese became more powerful in Harbin. However, the Japanese precipitated the "Manchurian incident" in September of 1931 and thus gained political and economic control with their puppet, Manchoukuo. In 1935 the Russians surrendered their last advantage when they sold their share of the Chinese-Eastern Railroad; in three months there was an exodus of 13,000 Soviet employees of the railroad from Harbin. Today, the Japanese dominate Harbin.

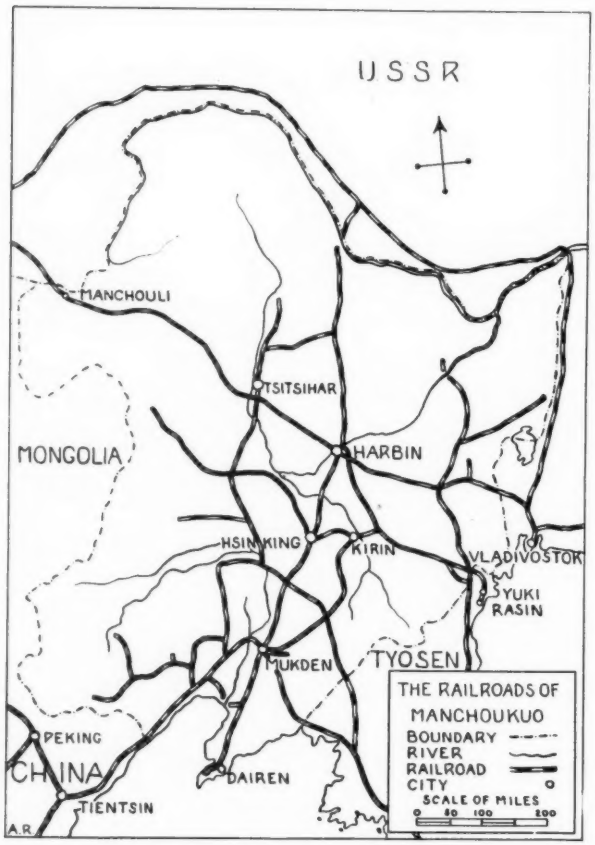

Fig. 2. The railroads of Manchoukuo.

THE CITY TODAY

Harbin, the major city of northern Manchoukuo, is now the second largest city in the country. In December, 1937, there were 457,980 persons in the city, 393,145 were Chinese; 26,347 were Japanese; 4,355 were Korean. In addition there were 34,133 persons, most of them having no nationality, i.e., White Russians. The

increasing Japanese population is mainly occupied in the communication, governmental, and commercial functions of the city. They have been moving into residences in New Town and locating their business section in southern Pristan, near the railroad. The White Russians are the most interesting group in the population. Harbin is the center of White Russian activities for the world. The people are engaged for the most part in commercial activities. Some are so poor that they are willing to do any sort of work. The Russians give an Occidental note to an otherwise Oriental city and make Harbin distinctive among the cities of Eastern Asia. The major population group, of course, is the Chinese. These people have immigrated into the region from North China in the last four decades. They are concerned in all the functions of the city. Many more Chinese pass thru Harbin in the spring and fall on their way to work on the extensive agricultural lands on the North Manchurian Plain. In some years these migrants create a serious relief problem.[1]

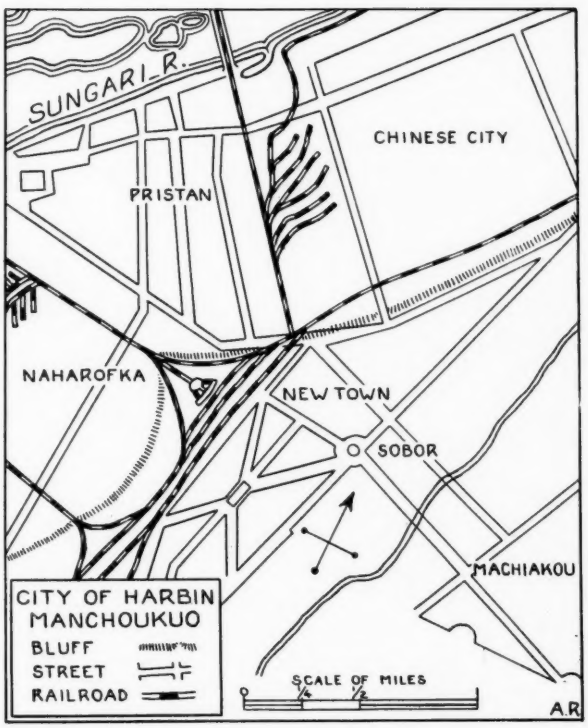

Fig. 3. The city of Harbin.

[1] The diverse population of Harbin is interesting to note. In walking in the Chinese section, one rarely sees a white person or a Japanese. The few Koreans are distinctive in their white clothing, but are concentrated in small groups in the Chinese districts. In New Town the racial differences are more pronounced. To obtain a quantitative idea of this, one can count the passers-by. For example, in walking in this section from Tsitsihar Skaya to the Sobor on the morning of November 2, 1938, I counted 58 Russians, including 3 beggars, 42 Chinese, including 2 beggars, and 14 Japanese. Then turning from the Sobor down four blocks toward the railroad station, I counted 11 Russians, including 1 beggar, 30 Chinese, and 27 Japanese, including 10 children.

The activities of the population are primarily the result of the location of Harbin at the crossroads of communications and in the center of a productive umland. The railroad crossing makes the commercial and communication function one of the major elements in the life of the city. Coupled with the railroad activities are the shipping facilities of the Sungari River. For many years the city was so important a junction that over 80 per cent of the trade of the North Manchurian Plain was centered in Harbin.

Fig. 4. A street scene in Harbin.

The exports and imports reflect the importance of the umland upon Harbin. The surrounding region is an extensive agricultural plain; in this region dry-field products such as soy beans, millet, and wheat predominate. Soy beans, suitable for myriad uses, is the most important of the products. Formerly the processing of these beans, making them into cakes and oil, was done in the city. However, in recent years there has been a decrease in the demand for these soy bean products for export and consequently a decline in the industry. With the centralization of government and railroad facilities, the shipments which were formerly transhipped at Harbin are passing directly to the ports of Dairen to the southwest and

to Rasin and Yuki in Korea to the southeast. It may be that this former function of the city will never be regained. For example, in 1935, $787,880 worth of beans and peas were exported, whereas in 1936, only $13,000, and in 1937, none were exported from Harbin. Because of the variations in recent years, the data for 1935, 1936, and 1937 have been grouped together; the graf shows the major exports and imports of the Harbin Customs District. For most of

Fig. 5. Factories in the industrial section of Harbin.

its history, as shown on the graf of total trade from 1908 to 1937, Harbin has been predominantly an exporting city. Beans and peas were the major exports, altho as has been noted, this export came to a stop in 1937. This cessation is probably a temporary condition. In recent years, Harbin has been of more importance as an importing center for this region. The influence of the change in political status has been one of the causes, a problem too complex for presentation here. The imports reflect the demand of the umland for cotton and other textiles, for metallic manufactures, and for sundry merchandise for the agricultural population. In some years there is a large import of gunny bags for the handling of soy beans. There are a number of banks, including American and British branches, and many commercial houses in Harbin. The Japanese now have the favored positions in the trade of Harbin and dominate the commercial activities of the city.

Harbin is the greatest industrial center of the North Manchurian Plain; the manufacturing activities are also influenced by the umland; they are dependent for raw materials on the agricultural production of the surrounding area. The most important industry is soy bean processing. During the World War, under

special trade advantages, the industry had a large expansion and Harbin reached its peak of economic prosperity. However, the use of new methods, the advent of the new political regime, the competition of south Manchuria, and the loss of export markets, have been factors in the slump of the soy bean processing industries. Altho during the previous decades over forty mills were in operation, from 1932 to 1935 only twelve were functioning in Harbin. There was a proportionate decrease in bean cake and bean oil produced. Another important industry is flour milling, based upon the wheat grown on the North Manchurian Plain. The government has been able to maintain the local industry by restricting foreign flour imports. In 1935 nine mills produced over six million bags of flour. The third major industry is brewing, also dependent upon the agricultural products from the umland. Kaoliang, wheat, barley, and millet are the basic crops which are used in the manufacture of alcohol, beer, vodka, and sake. Harbin is the largest center for such manufacturing in Manchoukuo and great expansion has taken place in recent years. In addition to these important industries there are minor enterprises manufacturing cotton and woolen textiles, cement, sugar, and tobacco.

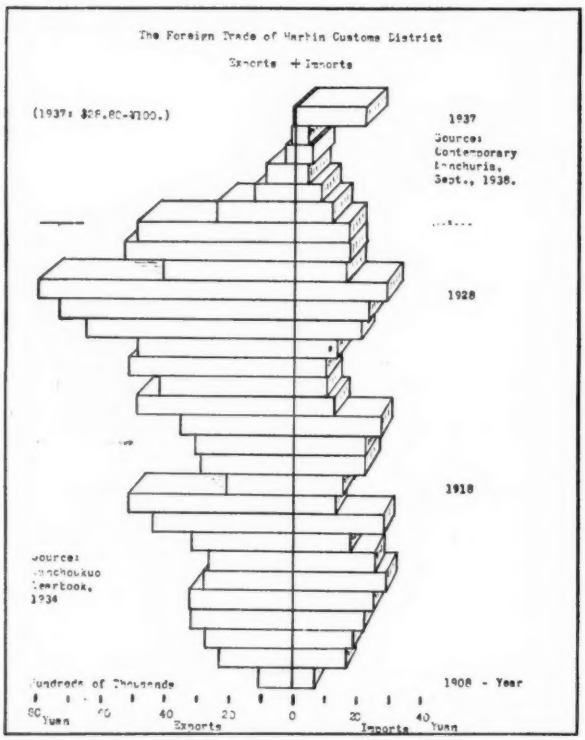

Fig. 6. The foreign trade of the Harbin customs district.

The population carries on considerable social activities. Harbin has a municipal government; it is worth noting that in May, 1938, five of the nine key positions were held by Japanese and all of the departments had Japanese advisors. It is the seat of the govern-

ment of Pinkiang province. There are a number of public and private schools; but even yet only a very small percentage of the school-age population receives formal education. There are temples and churches for all types of religious groups in the diverse population. Most striking architecturally are the Russian Orthodox churches with their domes and spires. Cabarets, theaters, summer and winter sports give contrast to the social life of the city.

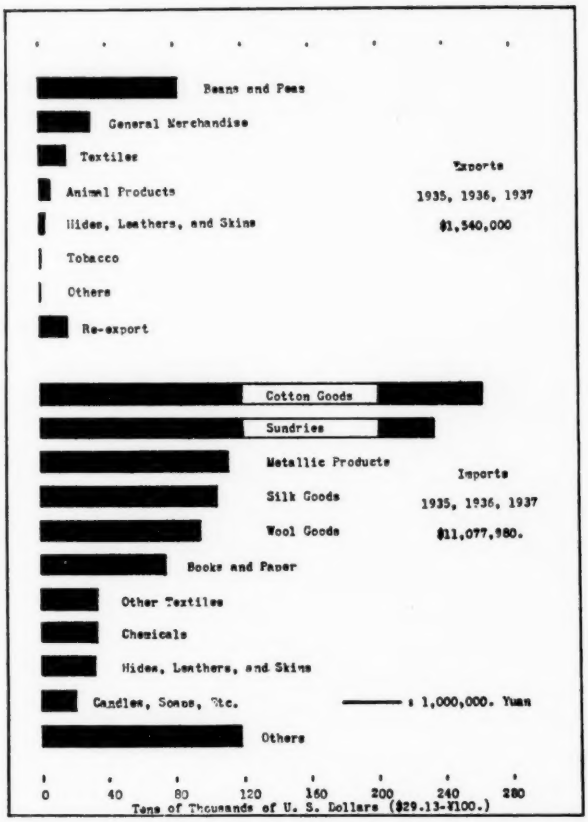

Fig. 7. Foreign trade of Harbin, 1935, 1936, and 1937. Source: *Contemporary Manchuria*, September, 1938.

As different as the social phases are the varied forms of conveyances on the streets of Harbin. The Russian drohsky drawn by an old nag will pass the ricksha pulled by the tired Chinese, only to be crowded to the curb by the blast of the horn on an old Overland roaring down the street under the hands of a son of a Cossack. Wagons, trucks, busses, and streetcars seem luxurious to the Chinese peddlar with a pole over his shoulder and two baskets swinging at his knees. The iron-studded wheels of the carts rumble over the cobblestones so slowly in summer in contrast to the swift motion of the sleighs gliding over the streets in winter.

The city of Harbin will probably remain the dominating center of the North Manchurian Plain. If this pioneer area becomes more important, Harbin will share in its growth. Just as the Russians laid out extensive plans for the city as its base for this region, the Japanese today are making plans for the spread of the city. The

future Harbin is to have a radius of 15 miles; there is to be an extension of the residential areas away from the river; the commercial and industrial area along the river, and in all sections new streets, public parks and buildings. In thirty years the city is to have a population of over a million. However, despite the Russian origin and the present dominance of the Japanese, Harbin will remain essentially Chinese in population. But with all its diverse human elements, the city will continue to be influenced by its distinctive geographic location.

CLIMATE: A FACTOR OF ECONOMIC LIFE

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State Teachers College, Livingston, Alabama

Many complicated phases of economic life, embracing occupation, health, comfort, recreation, and cultural progress, fall definitely under the influence of climatic environment. In a broad sense all life reflects the climatic factor. Altho climate rarely, if ever, acts as a *determining* agent, in some instances climatic influences become so strong that man has slight choice in adjusting himself to his environment.

In polar lands climate draws rather rigid limits, thereby restricting man's activities and curbing his achievements. In the hot, moist tropics the enervating effect of climate holds activity and culture at a low ebb. But, in the temperate lands, seasonal variability and cyclonic activity produce climatic conditions suitable to high cultural development. Obviously, these temperate lands nurture the world's leading peoples.

Agriculture, the cornerstone of civilization and the basic industry of economic geography, feeds and clothes the greater part of the world's population. More than any other great industry, agriculture, in all its phases, depends directly and definitely upon climate.

Some phases of agriculture, including the citrus fruit industry, succeed only in restricted areas where narrow climatic limits confine them. Other agricultural activities, such as cattle raising and wheat growing, flourish within extensive climatic limits. But, upon every kind of agricultural product, and in every agricultural region, climate exerts its influence as favorable or unfavorable, positive or negative, strong or weak.

MANY CLIMATES—MANY CROPS

Large size, involving wide latitudinal extent and north-south trend of land features, obtains for the United States great variety and wide range of climates, varying from wet tropical climate to cold subpolar climate, and from tropical desert climate to rain-drenched cool marine climate. At least one-half the climatic types recognized in most world classifications prevail in continental United States.

Save for a short list of tropical crops including bananas, cacao, and rubber, and a few products requiring cheap hand labor, such as tea and silk, a table of our farm products reads like a world list. From the delicate lemon grove of southern California to the hardy barley field of Dakota; from the date palm orchard of our western oases to the sugar-cane plantation of Louisiana; from the red grape-fruit grove of the Lower Rio Grande Valley to the cranberry marsh of Cape Cod; from the market garden of Long Island to the 10-square mile wheat farm or the 100-square mile cattle ranch of Montana—this is the agricultural range which climate permits and encourages in the United States.

WHEAT OR CATTLE?

In regions bordering on aridity rainfall becomes very unreliable. *Average* conditions rarely occur; and seasons with rainfall below average often bring serious droughts. A deviation of five or six inches from the average annual rainfall matters little in climates with 35 to 50 inches annual precipitation; but in regions averaging only 20 inches, so great a deficit proves disastrous to farming.

High prices sent thousands of wheat farmers into the High Plains east of the Rocky Mountains in the boom period following the World War. Fertile virgin soil, big machines, and a few seasonable years brought success. Dodge City and other Kansas towns did a thriving business and experienced considerable growth; and Amarillo, Texas (annual precipitation 21 inches), already a great cattle market, became the wheat capital of the Texas Panhandle. During the same period, a new cotton region opened on the High Plains farther south, producing a half-million bales in favorable years. But scant and unreliable rainfall makes farming a doubtful occupation in this region. Severe droughts and accompanying choking dust storms bring untold suffering. During the early and middle 1930's, drought and dust storms took tremendous toll in soil, grass,

crops, and livestock; and they contributed materially toward driving back the wheat farmer and otherwise greatly reducing the crop acreage of the High Plains.

Continued cropping under present methods can neither conserve the remaining soil and grass nor restore the loss. Climate forbids. Well-ordered grazing might eventually accomplish these ends. A pertinent question thus arises: Will wheat and cotton farming continue until erosion destroys both soil and grass, or will the cattleman again reign supreme on the High Plains?

SHARP TRANSITIONS IN GROWING SEASON

THE CHESAPEAKE REGION

The length of the growing season, a factor very important to such crops as cotton and sugar-cane that require a long season for growth and maturity, also proves highly significant in the production of quickly maturing vegetables, the profitable raising of which depends on early spring or late fall marketing.

A six-hour drive southward along Chesapeake Bay sees the growing season lengthen by sixty days. From Baltimore, Maryland, with 187 frost-free days, the span stretches to 245 days at Cape Henry, near Norfolk, Virginia. This rapid transition expresses itself in the truck farming of the region. The Norfolk area, one of the leading vegetable regions on the Atlantic Coast, enjoys a decided advantage over regions farther north. With a growing season comparable in length to that of Vicksburg, Mississippi (but with a spring opening about two weeks later), Norfolk sends vegetables by boat, truck, and train to the big eastern markets, one to three weeks before the Delaware, New Jersey, and Long Island sections come into production. Thus, the Norfolk area enjoys several days of market monopoly and good prices.

BIG RISKS AND BIG DIVIDENDS

THE CITRUS INDUSTRY

The growing habits of citrus fruits restrict their production to very limited areas. Let us examine the climatic conditions of our two major citrus regions, Southern California and Florida, and see wherein they are alike and wherein they differ. Climatic maps, grafs, and tables for Los Angeles and Miami bring out two striking similarities: (1) relatively even annual courses of temperature, and (2) mild and nearly equally rainy winters. But Miami receives heavy rainfall, especially in summer and autumn, in contrast to

almost rainless summers at Los Angeles. Summer and autumn temperatures also average somewhat higher for Miami. Thus, these differences make necessary the classification of Florida and Southern California into entirely different climatic types.

The climatic requisite of citrus fruit, therefore, appears to be mild winter temperatures; and if summer rainfall proves insufficient, irrigation may supply the necessary moisture. Tolerant of light frost, these fruits survive the *average* winter weather of the Gulf Coast and the Southern California regions. But occasional cold waves that sometimes reach blizzard proportions cause great damage to citrus areas. This was the case in January, 1895, when the "big freeze" swept over and destroyed most of Florida's citrus groves.

Citrus farmers take many risks; but none is more hazardous than the risk of freezing weather. When cold waves threaten, warnings spread by air and wire bring sleepless nights to thousands; smudge fires, stoves, and other preventive and protecting devices score high costs on the farmer's financial ledger. Complete loss of bearing groves, as the 1895 freeze caused in Florida, results in disaster. Florida suffered for twenty years from that calamity. When seasons continue favorable, however, citrus farmers, cooperating under satisfactory organization, reap large dividends and enjoy prosperity.

CLIMATE AND OTHER INDUSTRIES

Like agriculture, but in definitely more limited degree, all other industries react to climatic conditions. The seasonal rhythm of activities in the logging camp of the North, the closed season in iron ore, coal, and grain shipping on the Great Lakes, the tremendous cost of removing snow from city streets (averaging a dollar per person annually for one large New England city), the seasonal flow of tourists in the rapidly rising recreation industry—these and many other important factors of economic geography root deeply in climatic environment.

GEOGRAPHY AND CURRENT EVENTS*

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University of Pittsburgh

HOW ARE CURRENT EVENTS RELATED TO MODERN GEOGRAPHY?

In modern geography we are endeavoring to discover how man is adjusting his activities to the physical environment. Consequently we are concerned with three problems, (1) What activities, both economic and cultural, is man carrying on in any given locality? (2) Why is he carrying on these particular activities? (3) What problem is he meeting? Current events which deal with these problems are geography. An illustration of this fact is the newspaper headline, "The Soviet Will Build Arctic Fuel Bases." The Soviet is building air bases on the Siberian Coast. The reason for building air bases in these high latitudes with their severe climate lies in the shape of the earth, the severe climate, and other natural conditions which make land and sea transportation difficult or impossible. Air transportation is hazardous but is possible. Man meets numerous problems in building and maintaining air bases in such regions, and these problems are chiefly the result of the physical environment. One can scan any newspaper and find several such articles dealing with man's activities in some part of the world in relation to the physical environment.

WHAT IS THE PURPOSE OF USING CURRENT EVENTS IN THE TEACHING OF GEOGRAPHY?

One purpose is to help the student to see how the subjects which they are studying in school are related to life in general. Many teachers and children are likely to think of geography as something between the backs of a book and with no application or connection to the activities of people in general.

Another purpose is to develop a critical, thoughtful attitude toward current happenings as reported in the newspapers. It is one thing to read newspapers and quite another to read them understandingly. To illustrate this point we will consider the following newspaper headline, "Hankow Falls." The majority of newspaper readers probably looked at the headline and said, "Too bad, guess the Japanese have the Chinese now." Then they skimmed rapidly the details in the article and dismissed it. They did not pause and

* Abstract of paper presented at Chicago meeting of the National Council of Geography Teachers, December, 1939.

think about the facts given and mentally answer such questions as these:

Why did it take the Japanese six months to take Hankow?

Why did they make drives toward the city from three directions?

Aside from the fact that Hankow was the temporary capital, what other facts caused the Japanese to determine to capture it at any cost?

What effect on foreign interests in China will Japanese control of the Yangtse River have?

These are only a few of the questions and associations which should be considered and thought thru if one had read this article intelligently.

How Should Current Events be Used in the Classroom?

The following suggestions may be of assistance to the teacher.

1. In the first place the event discussed in the classroom must be of real importance. The newspapers are filled with material of little or no consequence. The teacher can, with tact and patience, develop discrimination in her classes. The children will soon learn *what to skip, what to skim, and what to actually read in the true sense of reading.*

2. In any one class period only one of two items should be analyzed and discussed. There is not time for more if the item is of real importance, if the discussion is to be worthwhile, and some thinking is done.

3. The teacher should help the child to see the event in relation to the past and the future. Every event of importance has a past and will have a future. It doesn't just happen. Take the New England hurricane. Probably 99 per cent of the people thought such a hurricane had never struck New England before and never would again. However, a hundred years ago one struck with equal force in this same region. In 1893, 1894, and 1934 the area suffered from similar hurricanes originating in the Atlantic between Africa and the West Indies. These hurricanes were not as severe as this one. Their force had been spent in part before reaching the coast of New England, nevertheless considerable damage was done to shipping, to ports, and to railroads and highways on or near the coast. In the reconstruction work thruout New England, the possibility of future storms should be taken into consideration.

4. The item should be analyzed to find the interrelationships

between the human activities mentioned and the physical environment. To illustrate this point consider the article "Hankow Falls." The topography, the lakes and rivers, the soil, and the climatic conditions in the lower Yangtse valley were factors which delayed the Japanese armies and made possible the long resistance of the Chinese forces even tho they had few modern arms. Also, the iron and coal mines were factors in the determination of the Japanese to seize this area. Other factors were the importance of the Yangtse as a highway, and the rich agricultural lands of the valleys. Recently the Yangtse River again appeared in the headlines: "Japan May Reopen the Yangtse to Foreign Shipping."

5. The map should be used constantly. Every event has a specific location as well as a past and a future.

6. The articles of outstanding importance should be saved, filed, and eventually mounted in blank books for future reference. In the future years these books furnish a most interesting and valuable source of material to use in tracing the past of events which continue to appear in the headlines. They will help the children to see and appreciate the continuity of man's experiences in adjusting his activities to the physical environment. They will see the truth of the old saying that it is far better to work with nature than against nature.

They will begin also to see the application of many geographic principles, such as, an event in one part of the world is felt and affects life in practically all the world.

If the teacher of geography uses current events with discrimination, guiding his students in reading intelligently the current newspaper, he will be training his students in the art of thinking as well as in geography.

GEOGRAPHY: A LABORATORY SUBJECT*

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Geography is a science. If geography is a science then it should be taught as a science. A science, when well-taught, makes use of the elements in the environment which constitute that science. Either direct observation is made of the elements of that science in the field, or samples are brought into the classroom for laboratory study. Geography as a science, then, cannot be well-taught unless frequent and effective use is made of the laboratory materials which are peculiar to geography.

WHAT IS THE NATURE OF THE LABORATORY MATERIAL?

The laboratory materials for geography are the actual landscape, pictures, maps, grafs and statistics. The landscape is the prime laboratory material and is the basic source material for the geographer. Were it feasible, students ought to be taken to each region or country studied to make first hand observations of the actual landscape. Indeed, field work of areas near at hand should be a very vital part of the geography curriculum. However, field work in all areas studied is an obviously impossible procedure. What, then, is the best substitute for the real landscape? Quite naturally, pictures of the landscape. A group of well-selected pictures in the hands of a skilled teacher who knows how to direct her pupils to gaining actual landscape imagery from the pictures will serve almost equally as well as the actual landscape.

Pictures. Pictures may be used in several ways depending on the function they are to fulfill in the unit. At the outset of a unit pictures may be used to give a reconnaissance survey of the area to be studied. Or the pictures may be used in the motivation exercise to help raise the problem. Pictures may serve a very vital part in the assimilating exercise to answer some of the questions raised earlier in the unit. At the end of a unit pictures may serve as a check on conclusions drawn from other source materials. And, finally, pictures may be used as testing material.

Many good pictures are small and methods must be devised for using them which will enable all the children to see them at

* Abstract of paper presented at Chicago meeting of National Council of Geography Teachers, December, 1939.

close range. Pictures can most easily be used if they are passed around the room. It is wise when passing pictures around the room to give the word "pass" indicating that all pictures should be passed to the next person. Otherwise pictures accumulate on one desk while other children have none to look at. If the class is small, pictures may be displayed on the bulletin board, or strung on a wire around the room, in order that the children may go to them for information. One essential to remember when using pictures in the classroom is to give directions for the study of the pictures. These directions should be given before the pictures are passed around, for the exercise becomes practically worthless if the children look at the pictures without any definite aim in view.

The importance of gaining geographic information from pictures cannot be over-estimated and teachers of geography should build up picture files.

Maps. Maps, too, may be used in any of the five ways in which pictures may be used depending upon the function they are to fulfill in the unit. They may give a reconnaissance survey of the region to the more advanced student, or they may raise the problem, give information in the assimilating exercises, check on ideas gained thru the use of other materials or they, too, can be used as testing material.

Maps, if they have been correctly introduced in the earlier grades, should mean real landscape imagery to the pupil. Laboratory exercises using several maps as sources of information should not be attempted unless the pupils can read map symbols, scale of miles, legends, etc.

A laboratory exercise studying the physical-political map of a small area, for instance, will furnish the following information:

1. The city pattern
2. The major rail net
3. The topographic pattern
4. The drainage pattern
5. The sun behavior pattern

Most texts have good physical-political maps, therefore each child can be supplied with such a map. In addition, the wall map should be used, and one child should point out on the wall map each feature discussed. This helps the individual child to check his reactions on his own map.

Further laboratory work may be carried out with rainfall, temperature, growing season, crop and mineral maps. If pictures have been used earlier in the unit they will, no doubt, have given the student some indication of the rainfall, climate and crops of

that region. A laboratory exercise using rainfall, temperature and economic maps not only checks the ideas gained earlier but it adds to them by showing the child distribution of these items within the area.

Grafs. There are many ways in which grafs function in the geography work. In fact, grafs, too, may be used in any of the five ways suggested earlier in this paper. Grafs are a form of laboratory material better suited to the more advanced student in geography. The use of simple grafs may be started in the third year of geography. Grafs give a more vivid picture of relative, quantitative amounts than does any other form of geographical material and have, therefore, a definite place in the geography work.

If grafs are not available in the text or elsewhere, grafs may be made by the class during one of their laboratory periods. Making the grafs is a very valuable experience for the child for it concurrently provides material from which he may gain information and teaches him how to put facts in a graphic way.

Statistics. The use of statistics in the geography work should become much more wide spread, for statistics can fulfill all of the functions in the unit which have been mentioned under pictures and maps. However, statistics mean very little to the child, unless he is able to turn the figures into actual imagery. The number of people per square mile should be imagined into the probable number of homes in that area and the number of people living in each home. The statistics of areas should be turned into areas near at hand which are known. If statistics are used in this way frequently, the student soon acquires the habit of turning the abstract numbers into meaningful imagery. Valuable laboratory exercises are derived when the statistics are turned into maps or grafs.

WHY USE LABORATORY MATERIAL?

It is indeed true that profound students of geography have studied this laboratory material and have interpreted it for us in the written page. Why not let the student read what these well-known authors have to say about the region? Why take the time to study the laboratory material, for it takes more time to use these laboratory materials than it does to get the same information from the text? Because, the child must become an independent adult who can interpret the landscape about him, who can gain information from the numerous maps, pictures, and grafs in the new magazines and papers, and because that child must become an adult able to use the information he gets from all these sources to help plan for the best future use of his own national resources. And,

only, if the child has been given ample opportunity to find things out for himself will he become such an adult. Laboratory technique in the teaching of geography, certainly, offers one such opportunity.

TYPES OF RIVERS AND MOUNTAINS

EDGAR H. WEBSTER
Fairhope, Alabama

A mountain is an elevated portion of the land with small summit area (Salisbury). A lake is a depression in the surface of the earth which is filled with the water. A river is a stream of water flowing thru the land. These were definitions learned in Grammar School days when we first attacked the subject of geography. Later we learned that there are many types of mountains, many kinds of lakes, and a great variety of kinds of rivers.

This study of rivers was made by a Senior Normal class as an assignment in physiography. The School library was rather rich in texts upon geography and physiography. At the class exercise, one student wrote his list on the blackboard and the others added any not on his list. No one student had found a large number, but the sum total was decidedly creditable. It is not to be expected that any river is thoroly described by one of the kinds named in the list. Nor is it claimed that the list is altogether complete. For illustration, a report by the Canadian Geological survey, says of the Saguenay," . . . the Saguenay presents the general appearance, on superficial examination, of a *fault trench* that has been rounded and deepened into a *fiord estuary.*" (The italics are mine.)

TYPES OF RIVERS

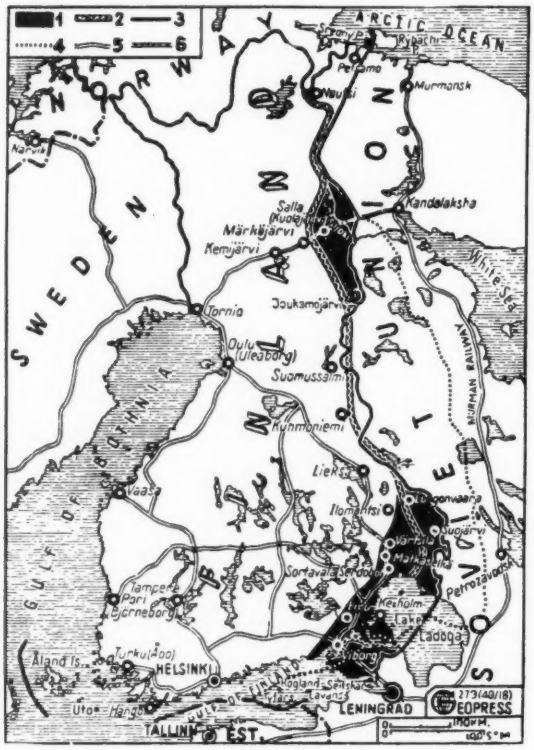
Consequent	Diverting	Interrupted	Land-bound
Subsequent	Continental	Overloaded	Captured
Antecedent	Entrenched	Transporting	Creek
Tributary	Graded	Branching	Winding
Distributary		Adjusted	Desert
Young	Revived	Master-sequent (?)	
Mature	International	Depositing	Alpine
Old	Pirate	Torrential	Barbed tributaries
Insequent	Dismembered	Ponded	Delta-forming
Obsequent	Snow-fed	Beheaded	Accordant
	Rain-fed		Trellis drainage
Permanent	Radical Consequent (?)	Underground	Dendritic drainage
Temporary		Navigable	Dead
Extended	Tidal River	Water-Power	Meandering
Rejuvenated	Drowned	Withering	Intermittent
Engrafted	Braided	Estuary	Jungle (?)
Superimposed			

TYPES OF MOUNTAINS

Folded	Arcuate	Residual	Mt. of accumulation
Fault Block	Young	Revived	Peak
Laccolithic	Mature	Chain	Obliterated
Volcanic	Old	Range	
Embayed			
	Glaciated	System	Cone-shaped
Arched	Fractured	Ridge	Stag-horn
Uinta-type	Plateau-formed	Bysmalith	Fault-scarp
Normal	Subdued	Batholith	Thrust-fault
Symmetrical Fold	Igneous	Boss	Hogback
Asymmetrical fold			
	Kliwpen	Barrier	Monadnock
Lava	Drang (Tarr P. 538)	Buried	Uplifted
Alpine		Mesa	Domed
Oceanic	Synclinae	Butte	Geosynclinal
Limestone	Anticlinal	Cordillera	Cuesta
Non-deformed	Monoclinal		
		Arrete	Plug
Dissected block	Submerged	Needle	Necx

EDITORIAL NOTES AND NEWS

Again international boundaries are shifted. Finland loses to U.S.S.R. approximately 13,500 square miles and 475,000 of its people, i.e., unless the people abandon their homes and migrate to some other part of Finland. The losses include the second largest city, Viipuri (Viborg), and many industrial enterprises. In the far north the Finnish portion of the Rybachi and Sredni peninsulas go to Russia. This area is small but important because it commands the Finnish shipping lanes of the Petsamo region. West of the White Sea the Finnish border is moved westward. Formerly it was only about 50 miles from the Murman Railway in this region. The treaty also provides for a new railroad to be built from Kandalakasha to Kemijärvi, where it will connect with an existing railroad to Sweden.



1. Territory ceded by Finland to U.S.S.R.
2. The front line on the day of armistice (March 13, 1940).
3. Finland's boundaries Nov. 30, 1939, before beginning of the hostilities.
4. Finnish-Soviet boundary according to the agreement of Dec. 2, 1939, concluded between the U.S.S.R. and the Kuusinen Government which was never ratified.
5. Main railways.
6. Projected railway Kemijärvi-Kandalaksha.

In the southwest Russia takes a thirty years lease on Hangö peninsula. This strategic location is to be used as a naval base, and together with numerous islands in the Gulf of Finland, gives Russia control over the trade routes of the Gulf. The greatest loss to Finland in wealth, area, population, and industries, is in the southeast where the boundary has been moved west of Lake Ladoga and Viipuri. Nearly 80 per cent of the exportable wealth of Finland was derived from its forests, and this was an outstanding production area. Among the industries lost are: sawmills, pulp wood, paper, cellulose, plywood, shoe factories, woolen mills, felt mills, flour mills, and power plants. Viipuri was the vital center for trade, industry, and shipping.

DR. J. R. WHITAKER has accepted an appointment as head of the department of geography, George Peabody College for Teachers, and will take up his new duties this summer. Dr. Whitaker also becomes an associate editor of the JOURNAL.

ERNA GRASSMUCK GILLAND will teach, during the coming summer session, at Eastern Washington College of Education, Cheney, Washington.

DR. O. W. FREEMAN will conduct a special teacher's workshop on Northwest Resources and Industries, in Reed College, Portland, Oregon, during the summer session.

DR. RICHARD HARTSHORNE has accepted an appointment as Associate Professor of Geography at the University of Wisconsin, and will begin his new duties in the fall.

At the time of the December meetings of the Association of American Geographers and the National Council of Geography Teachers in Chicago, the "young geographers" got together for a dinner and informal meeting. A loose, informal organization was set up with Dr. Edward Ackerman of Harvard as chairman. The objective is a meeting for people of similar interests which will afford them an opportunity to exchange ideas. It is probable that a similar meeting will be arranged for next December. As a preliminary step in mutual assistance, Dr. Shannon McCune of Ohio State University has compiled a list of contemplated research studies. A revision of this list will be prepared in June. Those interested should address Dr. McCune.

GEORGE B. CRESSEY, Chairman of the Department of Geology and Geography, Syracuse University, directed the work of translating the titles and legends in Volume One of the Great Soviet World Atlas. The translation was done by Andrew Perejda and Vera Washburne of Syracuse University. The Great Soviet World Atlas is the result of three years' research and drafting by a staff of nearly two hundred geographers and cartographers, and ranks as one of the world's greatest mapping achievements. Volume One deals with the world as a whole and the Soviet Union as a whole. Anyone interested in this translation should communicate with Dr. Cressey.

EARL B. SHAW, head of the geography department of the State Teachers College, Worcester, Massachusetts, will teach this summer at the University of Puerto Rico, at Rio Piedras.

ERNA GRASSMUCK GILLAND, Educational Relations Committee Chairman, announces three geography sectional meetings are being planned in connection with meetings of the National Education Association which meets in Milwaukee during the first week of July. The theme of one session is Frontiers in Secondary School Geographic Education. The other two sessions center on Geographic Learnings that Contribute to Education and Economic Well Being in our Democracy, which is in line with the theme of the Association.

The German island of Sylt, which has been the scene of recent air bombings, is just west of the former boundary between Germany and Denmark. It is connected to the mainland by the seven mile-long Hindenburg causeway. Part of its dune coast is ordinarily a popular summer beach resort, easily accessible because of the railway hookup afforded by the causeway. Its military significance as an air base and munitions base is very great.

J. HERBERT BURGY of the Department of Geology and Geography of the University of Illinois is to teach this summer at the University of Southern California. In exchange, Professor Malcom H. Bissel, head of the geography department in the University of Southern California, will teach at the University of Illinois.

There is an increasing demand for industrial diamonds, according to the United States Bureau of Mines. Only about one-fourth of the diamonds mined are classed as gems, the others are industrial diamonds. It is their superior hardness which makes industrial diamonds unsurpassed as a cutting agent or abrasive. Until recent years the Carbonado, or black diamond of Brazil, was the leading diamond abrasive. Now there is a drift towards the use of borts which are diamonds of the gem variety but unsuited for ornamental purposes, and even toward the use of diamond dust. The latter may be sintered into a solid mass, or imbedded in tungsten carbide or other powdered metal. For these industrial diamonds there are so many new uses that their consumption has more than doubled in the past four years.

According to H. H. Bennett, Chief of the Soil Conservation Service, more than a million farms are included in soil conservation districts organized to check soil erosion. These farms are included in 217 districts operating in 26 states. Additional districts are in the process of formation. All this has transpired since the first soil conservation district in the country was set up by farmers in southern North Carolina in August, 1937. The work is going forward along with the A.A.A. program started in 1933 to put agriculture on a permanent basis by reducing acreages of depleting crops and shifting others to soil-conserving crops. About 30 million acres have been so shifted in the past six years. This comes after an estimated loss of one-fourth of our soil covering.

The new Yearbook of the Department of Agriculture is called Food and Life. Two-thirds of it deals with the nutrition of animals and the other third with that of human beings. Schools get a free copy as long as the supply lasts.

The Boston Association of Geography Teachers of which Mary T. O'Connell is president, is continuing its publication of a four page bulletin edited by Leonard O. Packard. The October bulletin carries a useful article on radium by Viola M. Griffin. The January meeting of the Association was scheduled to hear Hon. Oskari Tokoi, first prime minister of Finland.

Mines and submarines in the North Atlantic and North Sea endanger shipping to such an extent that Lisbon, Portugal, is one of the leading ocean and air ports having hook-ups with overland travel routes. It lies south of the belligerent zone from which American shipping is quarantined.

At full capacity, the Bonnet Carre Spillway is reported capable of carrying away a volume of water comparable to that of Niagara Falls. This spillway which is thirty-five miles above New Orleans was opened in 1937 and, when open, diverts Mississippi flood waters into Lake Pontchartrain and thence into the Gulf.

According to a recent release from the United States Bureau of Mines, North Dakota produced a little more than two million tons of lignite in 1938, valued at $1.16 a ton. Texas was the second largest producer, followed by South Dakota and Montana. The figures relate only to active mines in commercial production.

The National Park Service Bulletin, "Vicksburg, National Military Park," contains some excellent photographs, charts and historical data, useful in the social studies classes. It is available from the National Park Service, Department of the Interior.

According to a release from the Agricultural Adjustment Administration, wildlife rehabilitation is not to be regarded as a by-product of conservation, but a direct result of land conservation. To this end the Federal government will recompense farmers for wild life conservation under the national farm program. The compensation ranges from $3.00 to $7.50 an acre. If the farmers find wildlife conservation practices feasible on their farms, they follow advice and suggestions of government experts. The most common practices center around the cultivation, protection, maintenance, and replanting, if necessary, of trees, shrubs and grasses beneficial for food and shelter of wildlife; also, the provision of water resources for water foul and aquatic life. All this is significant since more than half of the game and wildlife in the United States depends on privately owned land for its sustenance and support. This farm program is in addition to the work of the Bureau of Biological Survey which now operates almost 12 million acres as refuges for wildlife and an additional 4 millions for waterfowl and provides migratory birds with 200 stop-off stations affording food, shelter, and safety. In the West, big game has similar sanctuaries. In addition, Federal and State agencies have their areas for the protection of wildlife.

The completion of the laying of a new oil pipe line was recently celebrated in Colombia. This 263 mile pipe line cost millions of dollars as it is lain from a jungle lowland up over a range of the Andes, then down under the Magdalena River and its tributaries and out to the Caribbean at the Gulf of Morrosquillo. It would have been far cheaper to lay a short pipe line from the oil field down the Maracaibo lowland to Lake Maracaibo, but Colombia forbids shipment of its oil thru Venezuela. The tank farm on the Caribbean which stores the oil preparatory to its transshipment overseas by tankers is just south of Cartagena. The latter part adjoins the tank farm which is the terminus of the 350 mile pipe line from the Barranca Bermeja oilfield of the Magdalena River Basin. The Barranca field is the second greatest producing field in South America. How much this new field will rate is not stated but presumably its potentiality is great when American money ventures millions in a pipe line, not to mention the cost of getting equipment for developing the oil field in a veritable wilderness. The field is southwest of the Lagunillas, Venezuela, field on Lake Maracaibo, recently the scene of a devastating fire.

Printed booklets to supplement the World is Yours, a Sunday radio program, are now available at nominal cost from the United States Office of Education. These weekly illustrated bulletins contain source materials for use in connection with science and social studies, as well as general reference. The publication plan is sponsored by the United States Office of Education, Smithsonian Institution, the National Broadcasting Company, and Columbia University Press, with W. P. True, Editor of the Smithsonian Institution, supervising the preparation of the radio-print aids.

The following are a few notes selected from various random press releases by the staff of the Research Foundation of the Armour Institute of Technology in Chicago which set up the details of engineering and design of the Snow Cruiser. Besides the machinery required to control its operation, its floor space has living quarters and a scientific laboratory for four scientists, and enough storage space for a year's supplies without contact with the outside world. Mounted on top is a five-passenger airplane. For superior fuel economy and functioning in temperatures as low as —80° F., the Diesel type of engine was chosen. There are two Diesel engines, each connected to a generator which furnishes motive power as well as current for cooking, lighting, heating, operation of scientific equipment, etc. Each generator will drive the cruiser thru traction motors, one in each of the four large wheels, set up to permit one, two, three or four-wheel drive. Each wheel may be lifted into the chassis. This feature permits crossing of

crevasses as wide as 15 feet. Thus, when a crevasse is reached, the front wheels are lifted and the cruiser slides ahead on the ice while the rear wheels supply the power. When the front wheels are across the crevasse, they furnish the traction and the rear wheels are withdrawn. The cruiser was financed by friends of the Institute and industries interested in the Antarctic. When turned over to the Byrd expedition, it will be maintained by the government.

Two Coast Guard vessels have been recently placed on duty in mid-Atlantic between the Azores and Bermuda to furnish the weather bureau daily meteorological observations, if possible, at six hour intervals. There is a pressing need for this service since practically all European broadcasts of weather have been discontinued, along with those from ships of belligerent nations as well as some neutrals, in the eastern Atlantic. There have been days when gaps of more than a thousand miles have had no weather observations on which to make Atlantic weather maps for Atlantic shipping and aircraft.

The Alabama State Council of Geography Teachers held its annual meeting in March, at Birmingham Southern College. The following officers were elected: President, Lillian Worley, Alabama College for Women, Montevallo; Vice-President, Frances Nungester, Decatur; Secretary-Treasurer, Dr. J. Sullivan Gibson, Livingston State Teachers College; State Director, Dr. J. Allen Tower, Birmingham Southern College. The out-of-state speaker was Dr. W. Elmer Ekblaw, Clark University, who, while in the state, lectured on the Polar Eskimo at a number of colleges.

The third annual spring meeting of the Geography Section of the Maryland State Teachers Association was held April 27 at the State Teachers College, Frostburg, Maryland. The program dealt with the major industries of western Maryland and included a luncheon and a conducted excursion into a coal mine. Another field trip was planned for the following day. Ivan C. Diehl of the geography department of the Frostburg State Teachers College had charge of the program.

Two new National Park Bulletins which you may wish to add to your files are: Colonial National Historical Park, and Morristown National Historical Park.

According to Airway Weather Reports, New York's Commercial airport, for land and sea planes, called La Guardia Airport or North Beach Airport, on Long Island, had ideal flying conditions on an average of better than one day in three during the first three months of 1940. Snow proved a factor on twelve days and had to be removed. Smoke appeared half of the time. Spring and summer step-up will be very noticeable and will be marked by the introduction of the Boeing stratoliner.

Visitors to Mammoth Cave have a choice of six charted tours to view the wonders of this cave. They can even enjoy a meal at a hot lunch counter more than two hundred feet below the earth's surface.

When the construction of the Panama Canal resulted in the flooding of land now occupied by Gatun Lake, the highest points of land became islands. Fortunately, one of the islands was reserved for scientific use that its native plant and animal life might be perpetuated in an undisturbed habitat. This island, called Barro Colorado Island,

is about six square miles in area and is almost entirely wooded, the only changes permitted being those necessary in the construction of the biological laboratory, living quarters for the staff, loading docks and rails. Its accessibility from the Canal Zone, in contrast with the inaccessibility of most other similar tropical areas, has helped promote a wide range of research. Added impetus to study will undoubtedly result from the ease with which the Station studies may be extended to ones centered in the tropical forests of Panama, and especially the new Forest Reserve in the Canal Zone.

Visitors to the Coronado Cuarto Centennial, May 1 to September 15, will find some very interesting material is being released by the National Park Service in a series of monthly syndicated articles prepared by eminent scholars. The Park Service is preserving for posterity the Southwest's prehistoric ruins, Spanish Missions, storied trails, frontier posts, and scenic wonderlands, reminiscent of the 400th anniversary of the coming into the Southwest of the Spanish Conquistadores.

According to a recent issue of *Commerce Reports*, the ten leading exports, in value, of the United States in 1939 were machinery; petroleum and products; automobiles, parts and accessories; cotton, unmanufactured; iron and steel-mill products; chemicals; aircraft, including parts and accessories; copper, including ore and manufactures; fruits and nuts; and tobacco, unmanufactured. The leading imports were rubber, crude; coffee; paper and manufactures; cane sugar; raw silk; paper base stocks; chemicals and related products; tin; fruits and nuts; and wines and spirits.

A Department of Public Education has been established by the Corporation of the World's Fair of 1940 in New York which will issue brochures and informational materials for the use of teachers and students of various levels, in order that their visit to the Fair may be more enjoyable and profitable. Address your inquiries to Rudolf Kagey, Director.

The ten minerals which the War Department lists as strategic—meaning that the United States cannot produce them in sufficient quantities for war or industrial needs—are manganese, tin, tungsten, nickel, chromium, aluminum, antimony, mercury, platinum, and mica.

Vast stands of fir, cedar, spruce, and hemlock; luxuriant under growth of mosses and ferns; hundreds of species of wild flowers; deer, elk, and bear; trout streams and lakes; hot springs; rugged mountain peaks with heavy winter snowfall; these are the attractions that invite one to Olympic National Park, the youngest of our federal parks. Established a park by Congress in 1938, it has recently been greatly enlarged by presidential proclamation.

The MacGreggor Arctic Expedition to Etah, Greenland, 1937-1938, reported that as many as 2,000 icebergs could be seen at one time in Baffin Bay in August, 1937.

According to a recent report prepared by the Corps of Engineers, United States Army, modern machines at our Great Lakes ports have 15- and 17-ton buckets which can unload 2,000 tons of ore an hour from an ore vessel and place it directly in railroad cars or in open storage.

GEOGRAPHICAL PUBLICATIONS

Wallace W. Atwood. **The Physiographic Provinces of North America.** Ginn and Co., Boston, 1940. Pp. xvi + 536; 281 figures; 5 colored plates; 1 folded map (in pocket).

There has long been needed a treatise of moderate length on the physiographic provinces of the United States, in which emphasis is placed on geomorphic description rather than geology, and on the simpler rather than controversial aspects of geomorphic evolution. This need has now been filled by Atwood's Physiographic Provinces of North America. Geographers will find in this book a vivid, broad and yet understanding view of North American landforms, while geomorphologists will find here a good general background for further, more detailed studies of specific areas. Atwood has deliberately omitted detailed descriptions of stratigraphy, geologic structure and advanced geomorphic theory, but his generalized cross sections and sketches of geomorphic history give a picture of broad relationships which is very enlightening to the geographer, the non-geologist, and the beginner in regional physiographic study.

Despite the name, most of the volume is devoted to the United States; the sections dealing with Alaska and parts of Mexico and Canada are brief, tho useful and informative. The length of only 536 pages renders the book useful as collateral reading in studies treating other aspects of North America, and also permits the teacher to make liberal use of original source material in studies of regional physiography. The 281 figures include what is unquestionably the best collection of photographs ever assembled in a book of this character. Indeed, it may be said that this book for the first time presents a graphic visual picture of representative North American landforms. Many of the aerial photographs are particularly fine. The numerous ink drawings include block diagrams, shaded relief maps, and physiographic maps, many admirably executed by Erwin Raisz. In his descriptions, Atwood lays little emphasis on the delineation of boundaries but instead stresses the description of most characteristic and obvious features. Numerous areas of especial interest and accessibility, national parks, even scenic features and noted landmarks, are treated briefly and the reasons for their scenic value or popular interest are made clear. A feature that many will find useful is Atwood's careful description of physiographic processes, along with the landforms that are their present result. In this way the full usefulness of the volume is extended to all intelligent persons, even if unfamiliar with the basic concepts and terminology of physiography. However, despite these gestures to the non-scientist, Atwood has written in the language of geomorphology. Geological and physiographic concepts, peneplains, glacial and lacustrine stages, periods of earth history—all are given in the terms of geologist and geomorphologist. Atwood has deliberately avoided concepts or theories of a controversial and unproved nature, but the book is an up-to-date summary of many phases of North American physiography. For the reader interested chiefly in man's relations to his environment, the preliminary treatment of climate, soils, and natural regions of North America is enlightening, as well as the discussions of resources, settlement and occupational patterns that conclude each chapter under the name "approach to the human drama." Lists of representative togographic maps are included and will be helpful to the teacher.

Critics may urge that much of Atwood's text is not documented by footnotes, and that geology is not stated in sufficient detail. Such readers should consult Fenneman's monumental two volumes on Eastern and Western United States. Atwood has written the present volume to serve a different need on a lower and less technical instructional level, and in the reviewer's opinion, his book will find a wide and satisfactory use.

W. E. POWERS

Northwestern University

Edward E. Keso. **Conserving Our Resources.** 206 pp., illustrated. Times-Journal Publishing Co., Oklahoma City, Oklahoma. 1940. 98c.

In this volume Dr. Keso has pioneered the teaching of conversation at the junior high school level. The method followed is to discuss the general problem of conservation and then devote two chapters to each of the major resource materials such as soil, forests, water, minerals, and wildlife. Other chapters deal with parks as recreation areas, conservation of human beings, and conservation in Oklahoma. An extensive bibliography of government publications is given at the end of the book. All who are confronted with the problem of teaching conservation to children will find the book very useful.

Environment and Conflict in Europe. Pamphlet of 26 pp., and one sheet of maps, 42″ x 32″. American Geographical Society, Broadway at 156 St., N.Y. 1939. $1.00.

This set of eighteen basic maps, arranged on a single sheet, "illustrates facts of the environment closely connected with the conflict in its economic, political, and military aspects. Elements of strength and weakness in the structure and resources of the nations, objectives sought thru conquest or diplomatic pressure, and geographical conditions that may help or hinder the success of armed forces will all be apparent on examination and comparison of these maps." The central map shows the physical-political and many human features of central Europe. About the central map seventeen others are arranged. Among those are climatic, mineral resources, navigable waterways, international trade, population, languages, and boundaries of 1914 and September, 1939. The accompanying pamphlet carries a map of Finland, references, and a detailed index to places shown on the maps. Teachers and students of geography and the social studies will find these maps invaluable.

Mineral Map of the Dominion of Canada. Department of Mines and Resources, Ottawa, Canada. 1939. 25c.

This map (24″ x 34″) will be very useful to teachers and students. In addition to the usual features of good base maps, the map shows, location of all important mineral deposits, mineral producing areas, smelters, refineries, physiographic provinces, railways, and airways serving mining areas.

Guide to the Appalachian Trail in New England. 200 pp. + 2 maps. Publication No. 13 of the Appalachian Trail Conference Incorporated, Washington, D.C. 1939. $1.25.

The Guide is one of five describing the Appalachian Trail, the skyline hiking route along the crest of the Appalachians from Maine to Georgia. Trail mileage of this Guide is 431.16 miles, covering Connecticut, Massachusetts, Vermont and New Hampshire. Since the original edition of this Guide in 1933, the routes were rechecked in 1937. Those unsuited to travel due to the hurricane of 1938 have been omitted. For each section of the trail there is a generalized description, detailed trail data in both directions, together with approaches and available accommodations and references to other guides.

Ben F. Lemert. **Tobacco Manufacturing Industry in North Carolina.** 107 pp. Illustrated. National Youth Administration of North Carolina, Raleigh, North Carolina. 1939.

This survey was undertaken primarily to acquaint the young people of North Carolina with the tobacco industry of their state, that they might know what opportunity it affords for making a living and what qualifications they need to carry on the

various phases of the industry. A birdseye view is given of the soil, climate, labor, and equipment needed to produce, harvest, cure and sell the farm product; what it takes to process and manufacture it into various tobacco products; and what competition the industry meets from other producing areas. Early beginnings of the industry and the men who promoted the big business enterprises are briefly mentioned. About half of the publication is devoted to statistical tables, followed by a brief bibliography.

Walter Huebner. **Geology and Allied Sciences, A Thesaurus and a Co-ordination of English and German Specific and General Terms.** Part I, German—English. 405 pp. Veritas Press, 250 W. 57 St., N.Y. 1939. $7.50.

According to the author's preface, this volume bridges the gap that has heretofore made it very difficult to do research work in the geologic literature of the German, English and American languages. To make this coordination of terminology useful, he uses terms in actual use, designating those of restricted local usage, in order to clarify some of the confusion in meaning. The spelling of the German text is that of the best German scientific writing; the American is that of Funk and Wagnalls Standard Dictionary. More than 25,000 entries in each language are included. The work represents fifteen years of research.

Burton Holmes. **Mexico.** Burton Holmes Travel Stories. Text by Carlos Castillo, edited by and illustrations by Burton Holmes. 440 pp. Illustrated. Wheeler Publishing Co., Chicago, Ill. 1939.

As one leafs thru this book so profusely illustrated with photographs supplied by that veteran world-traveler and photographer, Burton Holmes, one is tempted to go thru it to the end just to see what the next picture is. Nearly every other page has a photograph, half or full-page size. From the text one gets the useful glimpses of what the Mexican peons eat, drink, and wear; what their crops and minerals are; how they entertain themselves; what their best native handwork is and where it may be bought; and what their past has been. In sharp contrast is the lavish splendor of their cathedrals, temples and monuments; the startling beauty of some of their mountains and flowers. The reader gets a warm feeling for these people and their culture, a desire to visit this land of such glaring contrasts in wealth, beauty, modern and ancient cultures.